ORIGINAL

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William F. Shore III, Esq. SBN 007728
Scott A. Burdman, Esq. SBN 019412
Robert H. Willis, Esq. SBN 022765
BURDMAN & SHORE, PLLC
2999 North 44th Street, Suite 535
Phoenix, Arizona 85018
Telephone: (602) 222-3023
Fax: (602) 222-3024
wshore@burdmanlaw.com

Attorneys for Plaintiffs, Robert B. Marshall Trust, et al.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
GARY PIERCE, Chairman
PAUL NEWMAN
SANDRA D. KENNEDY
BOB STUMP
BRENDA BURNS

IN THE MATTER OF THE APPLICATION OF BLACK MOUNTAIN SEWER CORPORATION, FOR A DETERMINATION OF THE FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICE BASED THEREON.	**DOCKET NO. SW-02361A-08-0609** **PUBLIC COMMENT OF ROBERT B. MARSHALL**

INTRODUCTION.

BMSC alleges that the waste water treatment plant located at The Boulders is code compliant and "useful." But, BMSC has not performed, or has not shared comprehensive, recent air quality testing measurements with the public regarding the WWTP. As a result, I hired Clark Seif Clark, an environmental engineering firm, to perform air quality testing at my home which is 75 feet from the plant. CSC found that H_2S concentrations exceeded multiple recognized standards: 1) from November 29, 2010, to December 6, 2010, H_2S concentrations were above the ATSDR odor threshold of .0005 parts per million (ppm) *87% of the time,* and 2) during the same period, H_2S concentrations were above the ATSDR cited concentrations which can result in increased

eye symptoms, nausea, headache, mental symptoms, and disease of the nervous system and sense organs of .01ppm *8% of the time*. Furthermore, seasonal factors impact sulfide production with typically four times higher sulfides produced in the summer than in the winter months. Based on the ATSDR seasonal fluctuation opinion, it is reasonable to believe H_2S concentrations will exceed the Maricopa County 30-minute average threshold of .03PPM during the Summer.

(1) The Robert B. Marshall Trust is the owner of Lot 167, THE BOULDERS CAREFREE UNIT FOUR, PHASE ONE, aka 1037 Boulder Drive, Carefree, Arizona 85377 ("my home"). I am the trustee of the Robert B. Marshall Trust. I am married to Kathy Marshall.

(2) BMSC operates a raw sewage collection system and waste water treatment plant (WWTP) located approximately 75 feet from my home, in the midst of the Boulders Carefree residential community.[1]

(3) Based on the public record, the WWTP and raw sewage collection system were constructed 43 years ago in 1969. The obsolete plant was neither designed nor constructed to be a permanent sewage treatment facility for the Boulders Community. In time, the WWTP came to serve approximately 50% of all homes, and all commercial establishments in the town of Carefree. It is the sole WWTP for the entire town.

(4) The WWTP and raw sewage collection system both continually generate pungent, nauseating odors, including unhealthy levels of hydrogen sulfide gas which migrate to and permeate my home.

(5) My wife Kathy and I have suffered nausea, eye irritation, headaches, extreme discomfort, sleeplessness, emotional distress, and other adverse physical and psychological effects from the inhalation of the odors and hydrogen sulfide gas.

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[1] **See Exhibit 1, map showing location of my residence, 1037 Boulder Drive in proximity to the WWTP.**

(6) Banging sounds and blower noises from the WWTP, and noises from service vehicles, pumper trucks, dumpsters, garbage trucks, and subcontractor vehicles create obnoxious noises at all times of the day and night.

(7) The odor and noise have deprived Kathy and I of the use, comfort, and enjoyment of our home because we are unable to open our windows to breath fresh air, cook or eat outdoors, and otherwise enjoy the Arizona lifestyle epitomized by the Boulders Community.

(8) Based on the public record, no less than 500 other residents of Carefree and Scottsdale have requested the closure of the WWTP and raw sewage collection system alleging pungent odors and/or obnoxious noises causing the inability to cook and eat food outdoors, inability to leave windows open to enjoy fresh air, noises from operation of the plant disturbing sleep, embarrassment to host guests who may experience intense odors, and golfers who must hold their breath as they pass the treatment plant.

(9) These intolerable conditions forced Kathy and I to leave our home and live elsewhere. Prior to leaving our beautiful home, we hired Clark Seif Clark, Inc., ("CSC") a well-respected environmental engineering firm to evaluate the air quality at our residence. We learned the following information.

(10) Hydrogen Sulfide (H_2S), produces the characteristic odor of rotten eggs that many people associate with sewer gas. It is a colorless and highly toxic gas that is easily detected by the human nose. Humans can detect H_2S at levels as low as 0.5 parts per billon (ppb). According to the CSC Report dated December 27, 2010[2] the following thresholds attributed to H_2S:

- Odor Threshold = 0.00005-0.01 parts per million (ppm).
- Increase in eye symptoms, nausea, headaches, mental symptoms, and diseases of the nervous system and sense organs = 0.01-0.6 ppm.

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[2] Table 1 Human Health Effects at Various Hydrogen Sulfide Concentrations in Air, in ATSDR, Public Health Assessments and Health Consultations: Mountain View Sewer Gas Investigation; Scottsdale, Maricopa County, Arizona, document found at http://www.atsdr.cdc.gov/HAC/pha/pha.asp?docid=914&pg=1#health, **Exhibit 2, Industrial Hygiene Position Letter, p.1.**

- Bronchial constriction in asthmatics – 2.0 ppm.
- Increased eye complaints; mild respiratory, cardiovascular, musculoskeletal, and metabolic changes = 5.0 ppm.
- Eye irritation = 3.6-21 ppm.
- Fatigue, loss of appetite, headache, irritability, poor memory, dizziness, etc. = 20 ppm.

(11) During the week of November 29-December 6, 2010, CSC collected thirty minute average readings from 0.025-0.026 ppm (25-26 ppb) at my residence. Such levels are above the odor threshold and are capable of increasing eye symptoms, nausea, headaches, mental symptoms, and diseases of the nervous system and sense organs. Id.

(12) In the same ATSDR document referenced above, the following standards and guidelines applicable to H_2S are presented in table 2:

Agency	Standard/Guideline	Exposure
World Health Organization (WHO)	30-minute odor annoyance guideline	0.005 ppm
Arizona Department of Environmental Quality (ADEQ)	24-hour AZ Ambient Air Quality Guideline (AAAQG's)	0.08 ppm
Agency for Toxic Substance and Disease Registry (ATSDR)	Acute (i.e. 1-14 days) Minimal Risk Levels (MRLs) and Comparison Value (CV)	0.07 ppm
Agency for Toxic Substance and Disease Registry (ATSDR)	Chronic (i.e. 14-364 days) MRL's & CV	0.03 ppm
U.S. Environmental Protection Agency (EPA)	Reference Concentration (RfC)	0.001 ppm[3]

[3] • MRL = An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects.

• CV = Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people.

• RfC = An estimate (with uncertainty spanning perhaps an order of magnitude) of daily inhalation exposure of the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

(13) According to the above standards and guidelines, the 30-minute average readings collected by CSC were above the following:

- WHO 30-minute odor annoyance guideline of 0.005 ppm.
- US EPA RfC of 0.0001 ppm.

(14) Finally, according to the Maricopa County Air Pollution Control Regulations, Regulation III – Control of Air Contaminants Rule 320: Odors and Gaseous Air Contaminants, section 304 states:

> No person shall emit hydrogen sulfide from any location in such a manner or amount that the concentration of such emissions into the ambient air at any occupied place beyond the premises on which the source is located exceeds 0.03 parts per million by volume for any averaging period of 30 minutes or more.

Readings during the week of November 29-December 6, 2010 did not exceed these levels for any 30-minute average; however, they did approach these levels. Furthermore, many of the point in time readings were greater than 0.03 ppm.

(15) Prolonged exposures to low concentrations of H_2S have been associated with neurological symptoms including fatigue, headache, nausea, dizziness, loss of appetite, irritability, impaired memory and altered mood states.[4]

(16) CSC's H_2S measurements at my residence indicated exceedence of the ATSDR inhalation acute MRL of 0.07 ppm and the intermediate-duration MRL of 0.02 ppm on multiple occasions. ATSDR's acute and chronic-duration studies suggest the respiratory tract and nervous system are sensitive targets of hydrogen sulfide.

(17) Indoor odors are a comfort issue according to ASHRAE Standard 62.1-2007. This standard is intended to be used to guide the improvement of indoor air quality (IAQ) in existing buildings. According to ASHRAE, acceptable IAQ should meet two criteria. First, there should be known contaminants at harmful concentrations as determined by cognizant authorities. Second, a substantial majority (80% or more) of the

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[4] **Exhibit 3, Declaration of Derrick A. Denis, CIAQP, CAC, CIEC, Clark Seif Clark, dated March 30, 2012.**

people exposed do not express dissatisfaction. In other words, 20% dissatisfaction is acceptable. In this case we have 100% dissatisfaction of occupants of my residence.

(18) Data collected by CSC at my residence in late fall from November 29, 2010 to December 6, 2010 indicated H_2S concentrations were above the ATSDR odor threshold of 0.0005 ppm **87% of the time**. During the same period, H_2S concentrations were above the ATSDR cited concentrations which can result in increased eye symptoms, nausea, headache, mental symptoms and disease of the nervous system and sense organs of 0.01 ppm **8% of the time**. Measurements also regularly exceeded WHO 30-minute odor annoyance guideline of 0.005 ppm.

(19) According to ATSDR, seasonal factors impact sulfide production with typically four times higher sulfides produced in the summer than in the winter. Therefore, the highest potential for odor and health impacts associated with sulfides occurs during the summer. CSC sampled around my residence during late Fall. Based on the ATSDR seasonal fluctuation position, it is reasonable to believe H_2S concentrations would exceed CSC's data during the summer. Concentrations approached the Maricopa County 30-minute average threshold of 0.03 ppm during the Fall testing. Other factors remaining equal, it is reasonable to believe this threshold will be exceeded with the ATSDR prediction of a 1-4 fold increase in summer sulfide production.

(20) Mr. Joel L. Wade, Manager of Engineering and Construction, Algonquin Water Services, LLC sent a letter on behalf of Black Mountain Sewer Company to Mayor Edward C. Morgan, Town of Carefree on May 27, 2005, stating:

> BMSC staff will continue to work diligently with environmental regulatory agencies, Town officials and community representatives to maintain an operation which is performing within all laws and regulation and is aesthetically acceptable to the surrounding community.[5]

[5] **Exhibit 4, Letter dated May 27, 2005, to the Town of Carefree.**

The WWTP is not aesthetically acceptable to the surrounding community as promised by Mr. Wade, and does not conform to recognized standards. For these reasons, I urgently request that the Commission order the closure of the WWTP.

Robert B. Marshall
1037 Boulder Drive
Carefree, AZ 85377

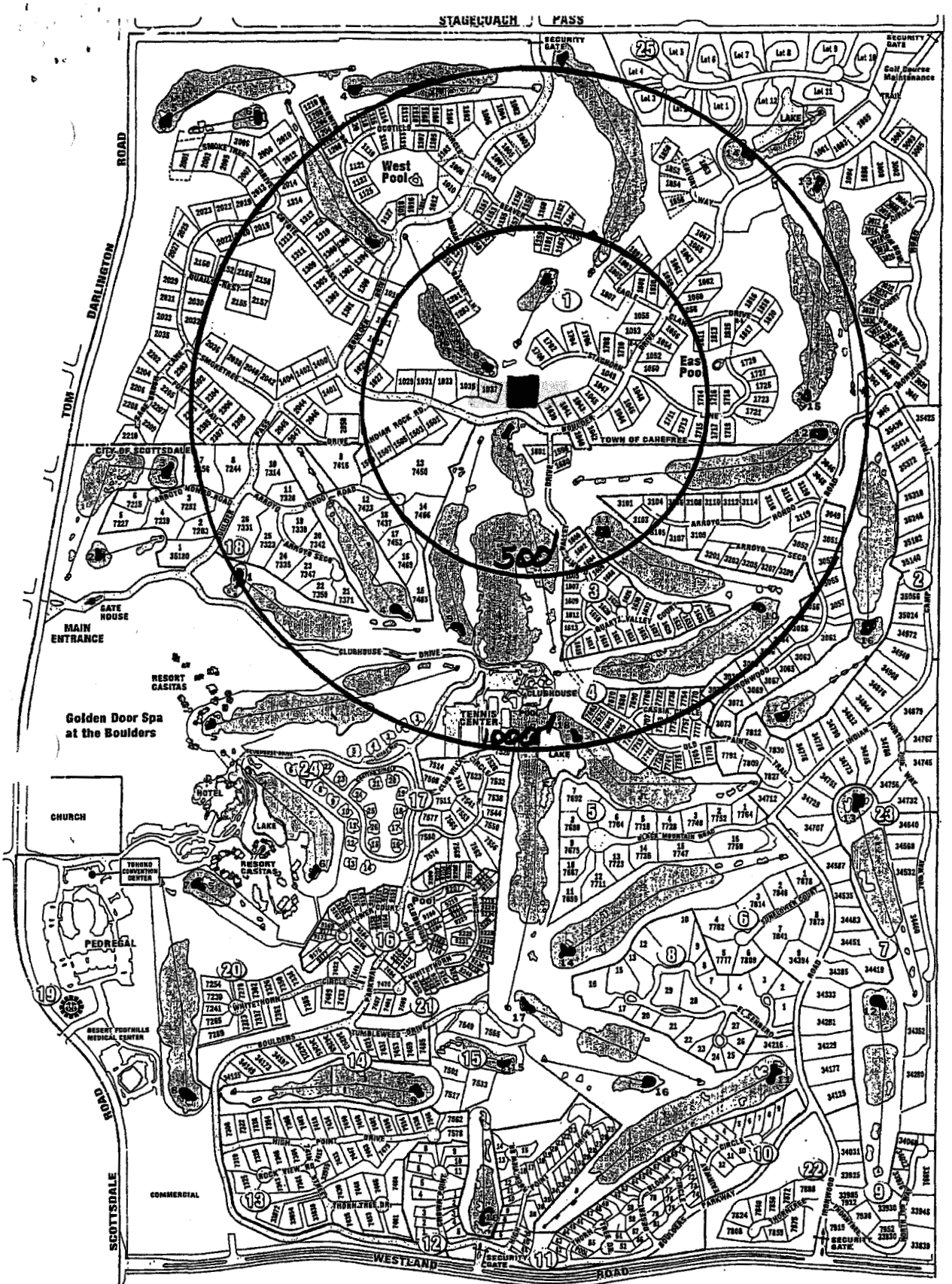
ORIGINAL and 13 copies served via U.S. Mail this 4th day of May, 2012 to:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 W. Washington Street
Phoenix, AZ 85007

COPY of the foregoing delivered via U.S. Mail this 4th day of May, 2012 to:

Arthur J. Bourque, Esq.
BOURQUE LAW FIRM
7301 North 16th Street, Suite 103
Phoenix AZ 85020

Scott S. Wakefield, Esq.
RIDENOUR, HIENTON & LEWIS, PLLC
201 North Central Avenue, Suite 3300
Phoenix, AZ 85004-1052



1. NORTH COMMUNITY
2. PALO BREA I
3. VILLAS
4. DESERT RIDGE
5. THE RESERVE
6. EL DESEO
7. PALO BREA II
8. ADOBES DE LA TIERRA
9. ACACIA
10. 5th GREEN II
11. 5th GREEN I
12. 5th GREEN II
13. GREYTHORN I
14. GREYTHORN II
15. ALTURA
16. PUEBLO EN LAS ROCAS
17. CLUB VILLAS
18. BOULDER ESTATES
19. RUSS LYON REALTY
20. ENCHANTRA
21. PUEBLO EN LAS ROCAS II
22. IRONWOOD
23. CROSSING
24. CACHET HOMES
25. LA ULTIMA PIEDRA

THE BOULDERS COMMUNITY

Map provided courtesy of Russ Lyon Realty Company. For Boulders information: (480) 488-2400

Mar 000274

HEALTH & SAFETY • ENGINEERING • ENVIRONMENTAL

December 27, 2010

CLIENT: Robert and Kathy Marshall
1037 Boulder Drive
Carefree, AZ 85277
Phone: 480-588-8349
Email: kmquick@hotmail.com

RE: Industrial Hygiene Position Letter
Physical Effects of Low Level Hydrogen Sulfide (H_2S)
CSC Project # 5002800

BACKGROUND

Sewer gas is a complex mixture of toxic and non-toxic gases that can be present at varying levels. Gases are formed during the decay of household and industrial waste. Sewer gas commonly contains hydrogen sulfide, ammonia, methane, carbon dioxide, sulfur dioxide, and nitrous oxides. Of these gases, -hydrogen sulfide and ammonia are commonly attributed to the malodor. In addition to the above gases, chlorine bleaches, industrial solvents, and gasoline are frequently present in municipal and privately owned-sewage treatment systems.

Hydrogen Sulfide (H_2S), also commonly referred to as "sewer gas", produces the characteristic odor of rotten eggs that many people associate with sewer-like odors. It is a colorless and highly toxic gas that is easily detected by the human nose. Humans can detect H_2S in levels as low as 0.5 parts per billion (ppb). According to table 1 Human Health Effects at Various Hydrogen Sulfide Concentrations in Air, in ATSDR Public health Assessments and Health Consultations: Mountain View Sewer Gas Investigation; Scottsdale, Maricopa County, Arizona document found at http://www.atsdr.cdc.gov/HAC/pha/pha.asp?docid=914&pg=1#health, CSC lists the following thresholds attributed to H_2S:

- Odor Threshold = 0.0005 – 0.01 parts per million (ppm)
- Increase in eye symptoms, nausea, headache, mental symptoms, and diseases of the nervous system and sense organs = 0.01 – 0.6 ppm.
- Bronchial constriction in asthmatics = 2.0 ppm.
- Increased eye complaints; mild respiratory, cardiovascular, musculoskeletal, and metabolic changes = 5.0 ppm
- Eye irritation = 3.6-21 ppm
- Fatigue, loss of appetite, headache, irritability, poor memory, dizziness, etc. = 20 ppm

During the week of November 29 – December 6, 2010, CSC collected thirty minute average readings from 0.025 – 0.026 ppm (25-26 ppb). According to the above document, such levels are above the odor threshold and are capable of increasing eye symptoms, nausea, headaches, mental symptoms, and diseases of the nervous system and sense organs. CSC notes that just because something is capable of creating an effect does not mean that it will in fact cause that effect.

In the same ATSDR document above, the following standards and guidelines applicable to H_2S in air are presented in table 2:

Agency	Standard/Guideline	Exposure
Occupational Safety and Health (OSHA)	8-hour Permissible Exposure Limit	10 ppm
National Institute for Occupational Safety and Health (NIOSH)	Recommended Exposure Limit (REL) 10-minute exposure ceiling	10 ppm
American Conference of Governmental Industrial Hygienist (ACGIH)	Threshold Limit Value (time weighted average)	10 ppm
World Health Organization (WHO)	30-minute odor annoyance guideline	0.005 ppm
Arizona Department of Environmental Quality (ADEQ)	24-hour AZ Ambient Air Quality Guideline (AAAQG's)	0.08 ppm
Agency for Toxic Substance and Disease Registry (ATSDR)	Acute (i.e. 1-14 days) Minimal Risk Levels (MRLs) and Comparison Value (CV)	0.07 ppm
Agency for Toxic Substance and Disease Registry (ATSDR)	Chronic (i.e. 14-364 days) MRL's & CV	0.03 ppm
U.S. Environmental Protection Agency (EPA)	Reference Concentration (RfC)	0.001 ppm

- MRL = An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects.
- CV = Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people.
- RfC = An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily inhalation exposure of the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

During the week of November 29 – December 6, 2010, CSC collected thirty minute average readings from 0.025 – 0.026 ppm (25-26 ppb). According to the above standards and guidelines, the averages were above the following:

- WHO 30-minute odor annoyance guideline of 0.005 ppm.
- US EPA RfC of 0.001 ppm.

Finally, according to the Maricopa County Air Pollution Control Regulations, Regulation III – Control of Air Contaminants Rule 320: Odors and Gaseous Air Contaminants, section 304 states: No person shall emit hydrogen sulfide from any location in such a manner or amount that the concentration of such emissions into the ambient air at any occupied place beyond the premises on which the source is located exceeds 0.03 parts per million by volume for any averaging period of 30 minutes or more. Readings during the week of November 29 – December 6, 2010 did not exceed these levels for any 30 minute average; however, they did approach those levels. Furthermore, many of the point in time readings were greater than 0.03 ppm.

SUMMARY

Based upon CSC's document research, levels observed at the Marshall residence are above the ATSDR odor threshold and are capable of increasing eye symptoms, nausea, headaches, mental symptoms, and diseases of the nervous system and sense organs. Furthermore, they are above the WHO 30-minute odor annoyance guideline and the US EPA RfC. While these levels may not pose a health concern in and of themselves, periodic environmental conditions and/or conditions at the water treatment facility may result in an increase or decrease of H_2S levels at the Marshall residence. A very modest increase would place the observed levels above the ADEQ AAAQG's and the ATSDR CV and MRL as well as the Maricopa County Rule 320.

REFERENCE MATERIAL:

ATSDR Public Health Assessments & Health Consultations: Mountain View Sewer Gas Investigation; Scottsdale, Maricopa County, AZ;
http://www.atsdr.cdc.gov/HAC/pha/pha.asp?docid=914&pg=1#health,

ATSDR Hydrogen Sulfide ToxFAQs™
http://www.atsdr.cdc.gov/tfacts114.pdf

OSHA Fact Sheet: Hydrogen Sulfide
http://www.osha.gov/OshDoc/data_Hurricane_Facts/hydrogen_sulfide_fact.pdf

LIMITATIONS

The assessment was executed in accordance with the authorized scope of work; however, this report does not indicate the termination of work at the subject property. This report is solely a record of activities, observations, analytical results, and recommendations performed to date. The field observations, measurements, and research reported herein are considered sufficient in detail and scope to form a reasonable basis for inspection and testing of the air quality with regards to hydrogen sulfide at the subject property. The assessment, conclusions, and recommendations presented herein are based upon the subjective evaluation of limited data.

This inspection and testing was developed to provide the client with information regarding apparent conditions relating to the subject property. Although CSC believes that the findings and conclusions provided in this report are reasonable, the assessment is necessarily limited to the conditions observed and to the information available at the time of the work. Due to the nature of the work, there is a possibility conditions exist that could not be identified within the scope of the assessment or which were not apparent at the time of our site work.

Clark Seif Clark, Inc. or those representing Clark Seif Clark bear no responsibility for the actual condition of the site pertaining to the air quality or soil contamination regardless of the actions taken by the client. The assessment is also limited to information available from the client at the time it was conducted. It is also possible that the testing methods employed at the time of the report may later be superseded by other methods. CSC does not accept responsibility for changes in the state of the art.

Thank you for choosing Clark Seif Clark, Inc. to provide professional consulting services. If for some reason you have any questions regarding this report, please do not hesitate to contact us.

Thank you,
Clark Seif Clark, Inc.

Written By,

Robert E. Crawley, CIEC
Industrial Hygiene Consultant

Reviewed By,

Paul V. Anderson, MS, CIEC
Industrial Hygienist

DECLARATION

My name is Derrick A. Denis. I make this declaration based upon facts known personally to me as of the date issued.

1. I have over 18 years experience in the industrial hygiene and environmental, health & safety profession. I have performed and/or managed over 13,000 indoor environmental quality projects. I hold a variety of relevant certifications including Council-Certified Indoor Environmental Consultant (CIEC) and Certified Indoor Air Quality Professional (CIAQP). I hold a B.S. in Environmental Science. I am the Chapter Director for the Phoenix Chapter of the Indoor Air Quality Association (IAQA) and I am the Vice President of the Board of Directors for the IAQA Nationally. Further, I sit on the Board of Directors of both the Arizona Chapter of the Environmental Information Association (EIA-AZ) and the Indoor Environmental Standards Organization (IESO). For the past twelve years I have worked for Clark Seif Clark, Inc. (hereinafter "CSC") in the capacity of Vice President of Indoor Air Quality. In 2002 I opened the CSC Phoenix area office, and I have been the branch manager ever since. I market, manage, and perform a wide variety of planned and emergency environmental projects including services such as indoor air quality investigations, mold inspections, asbestos surveys, bacteria surveys, noise monitoring surveys, mercury spill assessments, sewer gas investigations, lead risk assessments, radon assessments, etc.

2. CSC is hired by corporations, partnerships, and individuals on a recurring and on an "as needed" basis. CSC has a diversified clientele including, but not limited to: schools, hospitals, property managers, tenants, plaintiff attorneys, defense attorneys, HOAs, homeowners, insurance companies, policyholders, independent adjusters, public adjusters, etc. We strive for objectivity in performing fact gathering, conducting scientific analyses, and in reporting opinions, conclusions, and recommendations. We have no bias regarding the outcome of a project. In some cases our opinions bolster the position of our clients, and in other cases our opinions undermine the position of our clients.

3. CSC and I have worked for Burdman & Shore on a variety of environmental matters since around 2003, including, but not limited to projects related to mold and Chinese corrosive drywall.

4. CSC has worked for Robert and Kathy Marshall on multiple occasions regarding the malodor at their 1037 Boulder Drive home in Carefree, Arizona (CSC report 5002736 dated November 5, 2010, CSC report 5002769 dated December 9, 2010 and CSC report 5002800 dated December 27, 2010).

5. CSC continues to stand behind the observations, measurements, conclusions and recommendations contained in the CSC files related to the Marshall residence.

6. In preparation of this declaration I reviewed a variety of documents including, but not limited to:

    a. CSC files 5002736, 5002769 and 5002800

    b. Files provided by Burdman & Shore for job number 201203013 marked with Bates numbers including: BMSC 000055-000134, BMSC 000209-000910, BMSC 000980-001158, BMSC 001183-001857, BMSC 002239, BMSC 002230-002231, BMSC 002242-002243, BMSC 002252-002282, BMSC 002387-002727)

    c. Industry documents including, but not limited to: U.S. Department of Health & Human Services Public Health Service Agency for Toxic Substances & Disease Registry (ATSDR) "Toxicological Profile for Hydrogen Sulfide" dated July 2006. ATSDR document "Public Health Assessments & Health Consultation Mountain View Sewer Gas Investigation Scottsdale, Maricopa County Arizona" last updated January 25, 2010, Regulation III – Control of Air Contaminants Rule 320 Odor and Gaseous Air Contaminants last revised July 2, 2003.

7. My opinions expressed are based on conversations with CSC industrial hygienists Robert Crawley and Paul Anderson associated with the CSC work at the Marshall residence, review of CSC files, review of documents provided by Burdman & Shore, my education, my experience, and a variety of available industry documents.

8. Although hydrogen sulfide (H_2S) is one component of waste water treatment plant and sewer line airborne emissions, it is not the only constituent of concern capable of adversely impacting the health of exposed people. When considering the indoor environmental quality impact of airborne emissions from waste water (sewer) treatment plants and water (sewer) lines, it is a common oversight to focus only on H_2S. Airborne emissions from sewers and wastewater treatment plant can contain:

   - A wide variety of natural chemical components such as hydrogen sulfide (H_2S), ammonia (NH_3), mercaptan, nitrous oxides (NO_x) methane (CH_4), sulfur dioxide (SO_2), carbon dioxide (CO_2), etc.
   - A variety of wastewater treatment chemical additives such as sodium hypochlorite (bleach), etc.
   - Biological debris such as bacterial lipopolysaccharide endotoxins of Gram-negative bacteria (present whether bacteria is viable/alive or non-viable/dead).
   - Pathogens such as bacteria, parasites and viruses (although these are usually short lived in the environment). For example:
     - Bacteria like Salmonella, Shigella, Clostridium difficile, Escherichia coli, Giardia and Cryptosporidium.
     - Multi-cellular parasites like Pinworms (E. vermicularis), tapeworms and liver flukes.
     - Blood-borne pathogens such as HIV and hepatitis.
   - Increased insect activity (due to conditions such as increased standing water, increased organic stockpiles of sludge in drying beds, etc.)

All the above-listed items are common to the environment and many are part of the expected decay process occurring in the environment around us at all times. However, the tremendous volume and concentration of decaying organic material and additives coupled with the agitation and aerosolization in sewers and at wastewater treatment plants create a variety of microclimates of concern.

9. When it comes to odor and health it is vitally important to consider two things. First, just because there are bad or offensive odors does not mean there are health hazards. Second, just because there are pleasant odors or a lack of odor, does not mean an environment is safe. Many of the constituents of sewer gas do not have an odor such as methane or endotoxins. Although odorous, hydrogen sulfide is well documented to quickly cause olfactory fatigue, whereby exposure causes a reduction or a cessation in your ability to detect or gauge the concentration of H_2S present. At a minimum, odors are a nuisance to quality of life.

10. Enforceable sewer gas regulations and H_2S regulations are scarce (OSHA, Maricopa County) and, current regulations are primarily designed for acute exposures (i.e. one-time ceiling concentrations, 30 minute averages or 8 hour averages) to high concentrations in occupational settings. Current regulations are generally not relevant to this case. Guidelines and studies have more relevance to this case; however, most guidelines are specific to exposures to moderate or high concentrations for brief or moderate timeframes (i.e. 15 minutes, 4 hours, 24 hours or one year).

11. Statistics regarding the health effects of long-term, greater than 364 days, exposures to low concentrations of H_2S are scarce due to insufficient data. Without exposure data relevant to populations proximal to continuous sources of H_2S, such as near wastewater treatment plants, health studies are incomplete or speculative. Prolonged exposure to low concentrations of sewer gas has not been well studied. However, low concentrations of H_2S have been associated with neurological symptoms including fatigue, headache, nausea, dizziness, loss of appetite, irritability, impaired memory and altered mood states.

12. CSC's H_2S measurements at the Marshall residence indicated exceedence of the ATSDR inhalation acute minimal risk level (MRL) of 0.07 ppm and the intermediate-duration MRL of 0.02 ppm on multiple occasions. ATSDR states acute and chronic-duration studies suggest the respiratory tract and nervous system are sensitive targets of hydrogen sulfide.

13. Indoor odors are a comfort issue according to ASHRAE Standard 62.1-2007. This standard is intended to be used to guide the improvement of indoor air quality (IAQ) in existing buildings. According to ASHRAE, acceptable IAQ should meet two criteria. First, there should be no known contaminants at harmful concentrations as determined by cognizant authorities. Second, a substantial majority (80% or more) of the people exposed do not express dissatisfaction. In other words you can have up to 20% dissatisfaction. In this case we have 100% dissatisfaction of occupants of the Marshall residence.

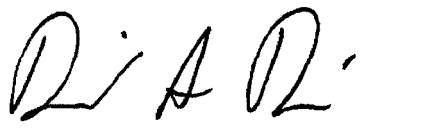
14. Data collected by CSC at the Marshall residence in late fall from November 29, 2010 to December 6, 2010 indicated H_2S concentrations were above the ATSDR odor threshold of 0.0005 ppm 87% of the time. During the same period, H_2S concentrations were above the ATSDR cited concentrations which can result in increased eye symptoms, nausea, headache, mental symptoms and disease of the nervous system and sense organs of 0.01 ppm 8% of the time. Measurements also regularly exceeded the World Health Organization (WHO) 30 minute odor annoyance guideline of 0.005 ppm.

15. Temporal factors (early winter vs. summer, morning vs. night, weekday vs. weekend, etc.) result in fluctuations in the volume and chemical composition of wastewater received by the sewer system and sewer treatment plant, resulting in fluctuations in emissions. Uncontrollable atmospheric conditions such as wind speed, wind direction, temperature and barometric pressure also play a role in the quantity, carryover and persistence of gases and particulate impacting adjacent properties.

16. According to ATSDR, seasonal factors impact sulfide production with typically four times higher sulfides produced in the summer than in the winter. Therefore, the highest potential for odor and health impacts associated with sulfides occurs during the summer. CSC sampled around the Marshall residence during the end of fall. Based on the ATSDR seasonal fluctuation position, it is reasonable to believe H_2S concentrations would exceed CSC's data during the summer. Concentrations approached the Maricopa County 30 minute average threshold of 0.03 ppm during the fall testing. Other factors remaining equal, it is reasonable to believe this threshold would be exceeded with the ATSDR prediction of a 1-4 fold increase in summer sulfide production.

17. This is a preliminary report. As such, CSC reserves the right to supplement the opinions herein based upon the availability of additional data.

I declare under penalty of perjury under the laws of the State of Arizona that the foregoing is true and correct to a reasonable degree of scientific certainty. Executed on March 30, 2012 in Tempe, Arizona.



Derrick Denis CIAQP, CAC, CIEC
Vice President of Indoor Environmental Quality

Clark Seif Clark, Inc. (CSC)
1553 West Todd Drive, Suite 201 – Tempe, AZ 85283
tel 480-460-8334 cel 602-757-8907 fax 480-460-8335
e-mail derrickdenis@csceng.com
www.csceng.com

1240/13

May 27, 2005

Mayor Edward C. Morgan
Town of Carefree
PO Box 740
100 Easy Street
Carefree, Arizona 85377

ALGONQUIN
WATER RESOURCES
OF AMERICA, INC.

Re: Black Mountain Sewer Company Operating Permit

Dear Mayor Morgan,

It was a pleasure to meet with you and Town council Members and guest on April 19, 2005 to discuss Black Mountain Sewer Company (BMSC) aggressive aesthetic improvement project that has led to more than 35 odor and sound improvements over the past twelve months.

In November of 2003 BMSC was made aware of certain sound and odor issues related to the operation of wastewater collection pumping and treatment systems owned and operated by this company. BMSC reviewed these issues with the Town of Carefree Council on December 12, 2003 and presented the issues of concern along with a well detailed twelve month timeline of action and improvements, leading to sound and odor reductions at or below regulatory standards. It is through these improvements that the following was achieved:

- Hydrogen sulfide (H2S) concentrations in the raw sewage stream reduced from 700 part per million (PPM) to just 2 PPM as measured entering the WWTP (a reduction of 99.7%)
- With nearly 250 hours of ambient odor recording, WWTP fence line H2S levels were reduced by 80% with average fence line H2S readings ranging from 0.0007 – 0.0040 PPM. (87% below current Maricopa County allowable standards of 0.030 PPM, and a peak H2S reading of 0.0060 (80% below Maricopa County allowable standards).
- With nearly 250 hours of ambient odor recordings, odor levels at the CIE pump station have been reduced to that below the detection capabilities of the instrumentation utilized (< 0.003 PPM) which is 90% below the current Maricopa County Standards.
- Odor Scrubber stack exhaust emission readings averaging 0.0 PPM H2S.
- WWTP sound levels reduced to ten (10) decibels below current ADEQ fence line standards.

During this twelve month improvement timeline, the following community outreach efforts took place:

- BMSC Staff met one-on-one with Town of Carefree Council officials on three separate occasions, these meetings took place at the City Hall meeting room (one scheduled meeting was canceled only after determining Council staff did not show up).
- BMSC Staff presented information and project updates at Town Council public meetings on

Algonquin Water Services, LLC
111 W. Wigwam Road
Suite B
Litchfield Park, AZ 85340

Ph: 623-935-9367
Fax: 623-935-1020

three separate occasions, two of which were held at the Carefree Inn and one meeting held at the City Hall meeting room.

- BMSC Staff provided on-site facility tours for individual town council members on two separate occasions, to review project improvements.
- BMSC Staff provided on-site facility tours for MCES staff on two separate occasions.
- BMSC Staff Provided on-site facility tours for ADEQ staff on two separate occasions.
- BMSC Staff distributed (door-to-door) approximately thirty (30) odor evaluation forms on two separate occasions. Although the importance of public cooperation of this data request was formally discussed at a public outreach meeting held at the town hall meeting rooms, of the 30 forms distributed, none were completed or returned.
- BMSC Staff distributed (via US Mail) industrial discharge flyers to all commercial customers of the BMSC.

As presented in the December 12, 2003 meeting between BMSC staff and Town Council Members, BMSC's resolution of the sound and odor issue has required a balanced approach of treating each of the aesthetic issues in combination with sustaining complete odor control in all problem areas. BMSC continues to address aesthetic issues by a combination of physical, chemical and mechanical improvements required to eliminate sewer conditions which promote odor formation and eliminate fugitive emissions from odor collection and treatment systems. The goal of this effort was to modify operating conditions to reduce noise issues and odor causing compounds to minimal levels, record these levels and modify the existing odor and sound control equipment to mitigate these levels with efficiency. As noted in the attached aesthetic improvement timeline, to date, BMSC has completed operating adjustments and modifications to the system that represents normal operating conditions. The sound and odor control studies initiated June 3, 2004, November 1, 2004 and January 10, 2005 recorded these conditions. From this information, adjustments and modifications to the odor and sound control systems have been made which will achieve and maintain odor control within regulatory guidelines.

As discussed at the December 12, 2003 meeting with Town Staff, the aesthetic improvement schedule required twelve months to complete. BMSC has worked diligently to understand the true elements of sound and odor issues, and to make prudent modifications which have led to the aforementioned sound and odor reductions. I have included the following documents for your use which document those successes listed above. These documents include the following:

- Gantt chart detailing the timeline of events and aesthetic improvement schedule.
- Information flyer and FAQ for Fats Oil and Grease control sent to all BMSC commercial customers.
- Sample correspondence letter and data collection form sent to all customers related to the aesthetic concerns of the facilities.
- Initial and draft final sound assessment conducted by Damon S. Williams and Associates (DSWA).
- Phase I odor control study - conducted by LTS Inc. as presented to Town of Carefree City Council.
- Phase II odor control study - conducted by LTS Inc. as presented to City Council.
- Phase III odor control study - conducted by LTS Inc.
- Phase IV Air Flow and Air Balance Report - conducted by LTS Inc.

- Phase Odor & Hydrogen Sulfide – existing odor scrubber stack emissions- conducted by LTS Inc.

BMSC has investigated, studied, designed and procured these aesthetic improvements on its own merit and without intervention of any regulating body. As is evidenced by the numerous improvements previously completed and recognized by the Town of Carefree Town Council, BMSC is committed to being a good neighbor in the Carefree community. BMSC is committed to continuing to operate and maintain the plant and appurtenant facilities in compliance with all regulatory requirements. In correlation with our continued aesthetic improvement effort BMSC is committed to completing the following improvements as proposed in the attached schedule.

- Boulders Plant and collection system pH profiling and optimization project – This effort will determine pH optimization of the collection system and plant treatment streams to optimize odor control while maintaining optimum process treatment of the wastewater treat systems at the Boulders Water Reclamation Facility.
- Boulders Drive Sewer Rehabilitation, Repair and Improvement Project – This project will rehabilitate and repair up to 3,000 linear feet of sewer collection main, to improve hydraulic capacity, reduce material deposits, while reducing the influence of storm water run-off infiltration into the treatment system. This repair effort is directly related to BMSC on-going sewer cleaning and inspection project.
- Sage Brush - Automated Chemical Feed System - Through BMSC Sage Brush chemical feed pilot study conducted in August of 2004, Staff determined that additional odor control chemical feed at the Sage Brush pump station can contribute to additional odor control at the Sage Brush pump station, Indian Bend pump station, as well as the confluence of the Indian Bend force main and CIE force main located at the intersection of Boulders Drive and Quartz Lane. Automating the chemical feed system will optimize the odor control chemical, while reducing manpower required to manually feed the chemical, which has been the practice since August of 2004.
- Security Fence – Boulders Water Reclamation Facility – BMSC met with Maricopa County Environmental Services (MCES) staff representatives William G. Kenning and Arizona Department of Environmental Quality (ADEQ) Staff Representative Gary Harmon on Wednesday, February 3, 2005. It was determined during this very thorough review and inspection of the Black Mountain Sewer Company (BMSC) Boulders Water Reclamation Facility, and collection system that perimeter security fencing is required around all perimeter points of the Boulders Water Reclamation Facility. Therefore BMSC Staff is committed to installing perimeter fencing and appropriate signage at this facility.
- Industrial Pretreatment Sample Ordinance – BMSC Staff will develop a sample Industrial Pretreatment Ordinance, which can be modified or adopted by the Town of Carefree to control FOG discharges into the sewer collection systems as well as control illicit discharges which have previously led to nuisance odors in the past.

BMSC Staff will continue to work diligently with environmental regulatory agencies, Town officials and community representatives to maintain an operation which is performing within all laws and regulation and is aesthetically acceptable to the surrounding community. If you have any questions, please contact my office at 623-298-4822.

Sincerely,
Black Mountain Sewer Company

Joel L. Wade
Manager of Engineering and Construction
Algonquin Water Services, L.L.C.

JLW/jlw : BMSC improvements

cc:
Michael D. Weber P.E., General Manager Algonquin Water Services, L.L.C. w/o attachment
Bob Dodds P.E., President, Operations Algonquin Power Services, L.L.C. w/o attachment
Charlie Hernandez – Operations Manager Algonquin Water Services, L.L.C. w/o attachment